

## Claims.

1        1. A process for recovering predetermined metal values from a metal  
2        containing material including the predetermined metal values comprising:  
3            digesting the metal containing material in a sulfuric acid solution  
4        comprising:  
5                sulfuric acid;  
6                a reducing agent; and  
7                a carbon source;  
8        for a period of time sufficient to solubilize the predetermined metal values;  
9                heating the digestion mixture for a period of time sufficient to attain 75-95  
10      °C; and  
11                separating the resulting solution from the remaining solids.

1        2. The process of claim 1 wherein the sulfuric acid solution further  
2        comprises hydrofluoric acid as a source of fluoride ion.

1        3. The process of claim 1 wherein the sulfuric acid solution comprises:  
2                0.09 to 0.4 pounds of concentrated sulfuric acid per pound of metal  
3        containing material solids (dry basis);  
4                0.01 to 0.03 pounds of a reducing agent per pound of metal containing  
5        material solids (dry basis);  
6                0.01 to 0.03 pounds of a carbon source per pound of metal containing  
7        material solids (dry basis); and  
8                sufficient water to make a solution of 5 to 15% sulfuric acid in water.

1        4. The process of claim 3 wherein the sulfuric acid solution further  
2        comprises:  
3                0.05 to 0.2, pounds of at least 50% hydrofluoric acid (HF) as a source of fluoride  
4        ion.

1        5. The process of claim 3 wherein the sulfuric acid solution comprises:  
2                0.33 pounds of concentrated sulfuric acid per pound of solids (dry basis);  
3                0.02 pounds of a reducing agent per pound of solids (dry basis);  
4                0.02 pounds of a carbon source per pound of solids (dry basis) and  
5                sufficient water to make a solution of 11% in sulfuric acid.

1       6. The process of claim 5 wherein the sulfuric acid solution further  
2 comprises:  
3       0.12 pounds per pound of solids (dry basis) 70% hydrofluoric acid (HF) as a  
4 source of fluoride ion.

1       7. The process of claim 3 further comprising the step of cooling the heated  
2 digestion mixture and wherein:  
3       the metal containing material is digested for at least 1 hour in the sulfuric  
4 acid solution;  
5       the digestion mixture is heated to above 75° C, for at least 0.5 hour;  
6       the resulting mixture is cooled to below 60° C;  
7 and the resulting solution is separated by filtering.

1       8. The process of claim 4 further comprising the step of cooling the heated  
2 digestion mixture and wherein:  
3       the metal containing material is digested for at least 1 hour in the sulfuric  
4 acid solution;  
5       the digestion mixture is heated to above 75° C, for at least 0.5 hour;  
6       the resulting mixture is cooled to below 60° C;  
7 and the resulting solution is separated by filtering.

1       9. The process of claim 1 further comprising the following steps after the  
2 separation step:  
3       washing the separated undissolved solids with a volume of water equal to  
4 the volume of the resulting solution separated (the filtrate) and  
5       recycling the wash water into the sulfuric acid solution utilized in the  
6 digestion step.

1       10. The process of claim 3 wherein the reducing agent is iron.

1       11. The process of claim 4 wherein the reducing agent is iron.

1       12. The process of claim 3 wherein the carbon source is activated carbon.

1       13. The process of claim 4 wherein the carbon source is activated carbon.

A handwritten signature or mark, appearing to read "add 03", is located at the bottom left of the page.